

ASSIGNMENT 7

Textbook Assignment: "Topographic Surveying and Mapping." Pages 8-1 through 8-24.

Learning Objective: Recognize procedures and definitions associated with horizontal and vertical control.

Learning Objective: Recognize procedures used in locating topographic details by the transit-tape method and the transit-stadia method. Compute horizontal distances and elevations.

7-1. Which of the following elements is representative of topographic maps?

1. The earth's surface
2. The earth's natural features
3. The man-made features
4. Each of the above

7-6. When topographic maps require a high degree of accuracy, what method of finding details is recommended?

1. Transit and tape
2. Transit and stadia
3. Transit and trigonometric leveling
4. EDM and level

7-2. Topographic map information is obtained in what manner?

1. From photographs
2. From other maps
3. By a topographic survey
4. By observation from aircraft

7-7. When time is more critical than a high degree of accuracy, what method of locating details is recommended?

1. Transit and tape
2. Transit and stadia
3. Transit and trigonometric leveling
4. EDM and level

7-3. Control points are located in what manner?

1. By triangulation only
2. By traversing only
3. Both 1 and 2 above
4. By indirect leveling

7-4. In a topographic survey of an area, what kind of control is established by crossties from one side of the area to another?

1. Primary
2. Secondary
3. Horizontal
4. Vertical

7-8. Which of the following actions should you take to avoid overcrowding and confusion when sketching details during fieldwork?

1. Use azimuths instead of deflection angles
2. Use numbers and legends for a large number of details
3. Both 1 and 2 above
4. Estimate distances and angles

7-5. Vertical control is normally established by which of the following means?

1. Direct leveling
2. Trigonometric leveling
3. Barometric leveling
4. Indirect leveling

- 7-9. The stadia method provides horizontal distances of a higher precision than those obtained by taping, EDM, or differential leveling.
1. True
 2. False

Learning Objective: Identify characteristics of instruments used for determining horizontal distances and elevations. Identify procedures for determining the vertical angle of a point by the transit-stadia method. Use basic terms and formulas and also perform computations that are used on topographic surveys.

- 7-10. Philadelphia rods should be used for stadia work for distances up to 1,500 feet.
1. True
 2. False

- 7-11. The *stadia interval* is defined as
1. the reading on the rod between the stadia hairs
 2. the distance to the stadia rod
 3. the reading between the upper stadia hair and the middle cross hair
 4. the reading between the lower stadia hair and the middle cross hair

- 7-12. When your stadia reading is more than the length of the rod, what procedure do you use?
1. Read a half-interval using the middle cross hair and then multiply the reading by 2
 2. Hold two rods together
 3. Make a rod in the BU shop that will be long enough
 4. Shorten your sighting

- 7-13. Stadia distance is equal to
1. the rod reading
 2. the rod reading divided by the stadia constant
 3. the stadia interval
 4. the stadia interval times the stadia constant

- 7-14. Stadia horizontal distances are normally recorded to what degree of accuracy?

1. To 0.01 ft with a target
2. To 0.1 ft over 300 ft
3. To the nearest foot
4. As close as possible

IN ANSWERING QUESTIONS 7-15 THROUGH 7-19, ASSUME THAT YOU ARE LOCATING POINTS *B* AND *C* BY THE TRANSIT-STADIA METHOD WITH THE INSTRUMENT SET UP AT STATION *A*. USE THE FOLLOWING INFORMATION:

Focal distance	=	1.00 ft
Elevation <i>A</i>	=	431.8 ft
Instrument height	=	4.5 ft
Rod reading	=	4.5 ft

<u>POINT</u>	<u>ROD INTERCEPT</u>	<u>VERTICAL ANGLE</u>
<i>B</i>	4.54	+3°18'
<i>C</i>	6.42	-2°44'

- 7-15. What is the horizontal distance *AB*?

1. 451.6 ft
2. 452.6 ft
3. 452.8 ft
4. 453.5 ft

- 7-16. The difference in elevation between station *A* and point *B* is

1. 26.1 ft
2. 26.2 ft
3. 26.4 ft
4. 26.6 ft

- 7-17. What is the elevation of point *B*?

1. 405.6 ft
2. 405.7 ft
3. 457.9 ft
4. 458.0 ft

- 7-18. If station *A* and points *B* and *C* are in a straight line with station *A* between points *B* and *C*, what is the distance between points *B* and *C*?
1. 640.5 ft
 2. 641.5 ft
 3. 1,095.0 ft
 4. 1,096.0 ft
- 7-19. What is the difference in elevation between points *B* and *C*?
1. 56.7 ft
 2. 46.3 ft
 3. 30.6 ft
 4. 16.5 ft
- 7-20. Stadia tables use a constant stadia distance of
1. 50 ft
 2. 100 ft
 3. 101 ft
 4. 200 ft
- 7-21. Unequal refraction caused by the sun's rays will have what effect on your data?
1. Cause longer distances than actual to be read
 2. Cause shorter distances than actual to be read
 3. Cause reversed vertical angles to be read
 4. Cause smaller vertical angles than actual to be read
- 7-22. How do you compensate for refraction?
1. By ignoring the instrument constant
 2. By taking all readings at two different times of the day
 3. By shading the instrument
 4. By using the refraction compensation formula
- 7-23. The stadia circle provides conversion factors that are used with the stadia interval to determine vertical and horizontal distances.
1. True
 2. False
- 7-24. How is the arc reading of a multiplier scale used in computations?
1. Multiplied by the rod intercept to obtain the stadia distance
 2. Subtracted from the stadia distance
 3. Added to the rod intercept and then multiplied by the stadia constant
 4. Multiplied by the stadia interval to obtain the horizontal distance
- 7-25. The subtraction scale gives a percentage reading that is used to reduce your stadia distances to obtain the actual distances.
1. True
 2. False
- 7-26. You are using a transit with a multiplier stadia arc. You have a 93 reading on the horizontal stadia arc with a depressed vertical angle. The rod intercept is 5.63. What is the horizontal distance?
1. 506.7 ft
 2. 523.6 ft
 3. 563.0 ft
 4. 602.4 ft
- 7-27. The elevation of station *A* is 325.5 ft and the HI is 329.7 ft. You are sighted on point *B*. You have a -7 reading on the vertical stadia arc, a rod reading of 4.2, and a rod intercept of 5.1. What is the elevation of point *B*?
1. 289.8 ft
 2. 318.8 ft
 3. 361.2 ft
 4. 372.9 ft

7-28. The Beaman stadia arc uses which of the following methods to determine horizontal distances?

1. Multiplier scale
2. Addition scale
3. Indirect scale
4. Subtraction scale

7-29. The rod intercept is 3.75 for point *B*. The **H** scale on the Beaman arc reads 10. What is the horizontal distance from the instrument to point *B*?

1. 337.5 ft
2. 371.3 ft
3. 378.8 ft
4. 412.5 ft

7-30. You have a reading of 80 on the **V** scale of the Beaman stadia arc. The rod intercept is 3.75. What is the difference in elevation between the instrument and the point sighted?

1. -10.25 ft
2. +10.25 ft
3. -30.00 ft
4. +30.00 ft

7-31. Which of the following procedures should you follow in determining the vertical angle of a point in a transit-stadia method?

1. Read the angle when the lower stadia hair intercepts the graduation mark on the stadia rod that corresponds to the actual HI above the ground surface
2. Read the angle when the upper stadia hair intercepts the graduation mark on the stadia rod that corresponds to the actual HI
3. Read the angle when the horizontal stadia hair intercepts the graduation mark on the stadia rod that corresponds to the actual HI above the ground surface
4. Read the angle when the vertical stadia hair intercepts the graduation mark on the stadia rod that corresponds to the actual HI above the ground surface

7-32. What method is used to determine the instrument height?

1. Take a rod reading on the point before the instrument setup
2. Use a tape or rod to measure the height after setting up over the point
3. Use balanced foresights and backsights and then obtain an average
4. Set the instrument up to your eye alignment

IN ANSWERING QUESTIONS 7-33 THROUGH 7-36, REFER TO APPENDIX II, TABLE AII-3. ALSO USE THE FOLLOWING INFORMATION:

Elevation station A	= 525.3 ft
Rod reading on point B	4.3
HI	4.3 ft
Stadia interval	6.1
Vertical angle to B	+5°20'
Focal length	0.75

7-33. What is the multiplier used to find the horizontal distance?

1. 99.14
2. 98.78
3. 99.43
4. 9.25

7-34. What is the horizontal distance from station A to point B?

1. 615.2 ft
2. 610.0 ft
3. 604.8 ft
4. 56.4 ft

7-35. What is the difference in elevation between station A and point B?

1. 5.64 ft
2. 6.10 ft
3. 56.40 ft
4. 604.80 ft

7-36. What correction factor do you apply to the elevation for the focal length?

1. Add 1.00 ft to the elevation
2. Add 0.75 ft to the elevation
3. Add 0.09 ft to the elevation
4. Add 0.07 ft to the elevation

Learning Objective: Identify the purpose of contour lines and identify definitions of related terms. Recognize procedures for using and interpreting contour lines; recognize the procedure for interpolating contour lines.

7-37. *Relief*, as applies to surveying, is defined as

1. the difference in elevation
2. variation in the features of the earth's surface
3. variation of natural features of the earth's surface
4. man-made variations of the earth's surface

7-38. Which of the following methods are used for relief maps?

1. 3-D models
2. Hachure lines
3. Shading representing shadows
4. Each of the above

7-39. On a map, a line that represents the same elevation for all points on the line is called a/an

1. contour line
2. elevation line
3. hachure line
4. grid line

7-40. Contour lines are used to show what type of information on a topographic map?

1. The quickest route
2. Boundaries
3. Rivers and streams
4. Relief

7-41. What is the difference between the values of adjacent contour lines called?

1. Index contour
2. Contour interval
3. Intermediate contour
4. Elevation interval

7-42. During a topographic survey, the actual contour points on the ground are located and plotted. This system is called

1. cross profiles
2. control points
3. grid control
4. tracing contours

7-43. The grid coordinate system works best on what type of features?

1. Slopes
2. Relatively level ground
3. Valleys
4. Shorelines and cliffs

7-44. Two points, A and B, are 125 feet apart. A 100-foot contour passes through point A and a 125-foot contour passes through point B and the slope is uniform. How far from point A, to scale, should you interpolate the 115-foot contour?

1. 15 ft
2. 50 ft
3. 75 ft
4. 115 ft

7-45. When drawing contour lines by using control points, what must you do to locate contour lines?

1. Scale
2. Interpolate
3. Average
4. Randomize

7-46. An area on a topographic map where contour lines are evenly spaced and wide apart represents a

1. valley
2. gentle, uniform slope
3. steep, uniform slope
4. ridge

7-47. In what direction does the curve of a contour line cross a stream?

1. Upstream
2. Westward
3. Downstream
4. Eastward

7-48. Contour lines represent what in relation to the earth's surface?

1. Horizontal planes
2. Vertical planes
3. Grid lines
4. Different points of elevation

7-49. A panoramic sketch shows the terrain in what manner?

1. In contour lines
2. In elevation
3. In perspective
4. Both 2 and 3 above

Learning Objective: Recognize appropriate scale for topographic maps; identify correct design and placement of topographic specifications.

7-50. Which of the following scales represent a large-scale topographic map?

1. 1 in. = 50 ft
2. 1 in. = 120 ft
3. 1 in. = 500 ft
4. 1 in. = 1,000 ft

7-51. Which of the following contour intervals should you use to prepare an intermediate-scale map of a hill?

1. 1 ft
2. 2 ft
3. 10 ft
4. 20 ft

7-52. Which of the following operations is NOT one of the basic operations for construction of a topographic map?

1. Plotting horizontal control
2. Plotting details and ground points
3. Determining slope distances
4. Drawing contour lines

7-53. What lines are drawn before the actual contour lines are plotted on a topographic map?

1. Spur and ridge lines
2. Vertical control and spur lines
3. Spur and valley lines
4. Ridge and valley lines

7-54. For clarity on small-scale maps, how should buildings and other features be shown?

1. To scale
2. Larger than scale and true to shape
3. Larger than scale and by symbols
4. By location in the notes

7-55. Which of the following devices is useful for interpolating contour lines rapidly?

1. Engineer's scale
2. Tracing cloth
3. Graduated rubber band
4. Each of the above

7-56. Topographic maps used for the design of construction drawings normally use what contour interval?

1. 1 or 2 ft
2. 1, 2, or 5 ft
3. 10 ft
4. 20 ft

7-57. Topographic maps used for preliminary site planning show which of the following features?

1. Only man-made
2. Only natural
3. Only minor
4. Each of the above